

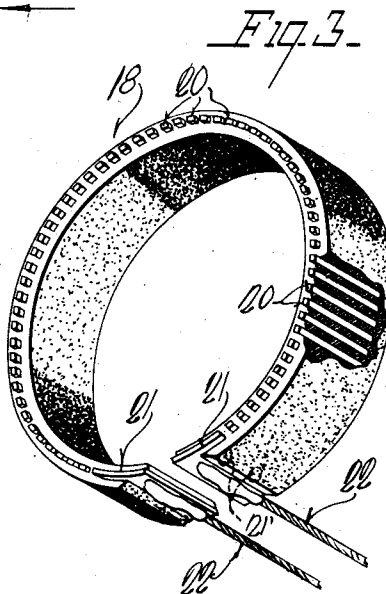
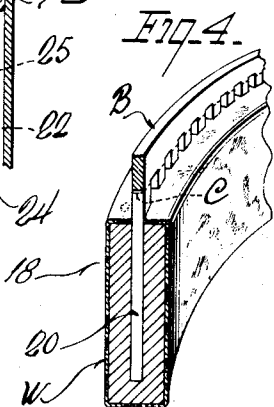
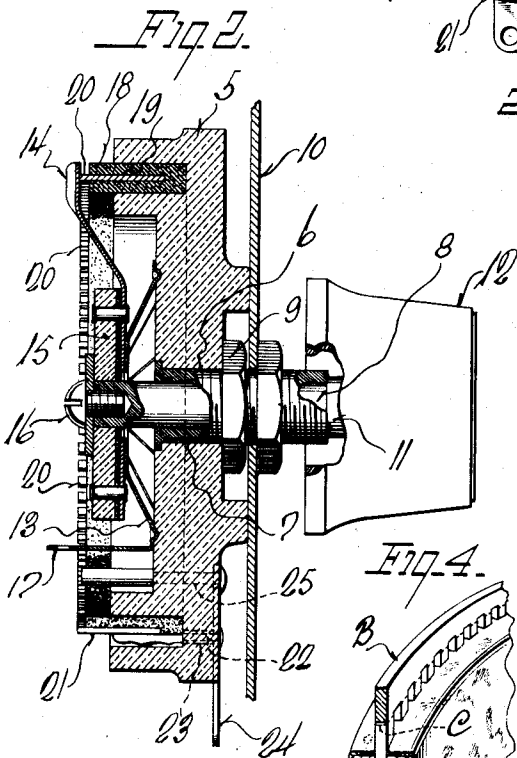
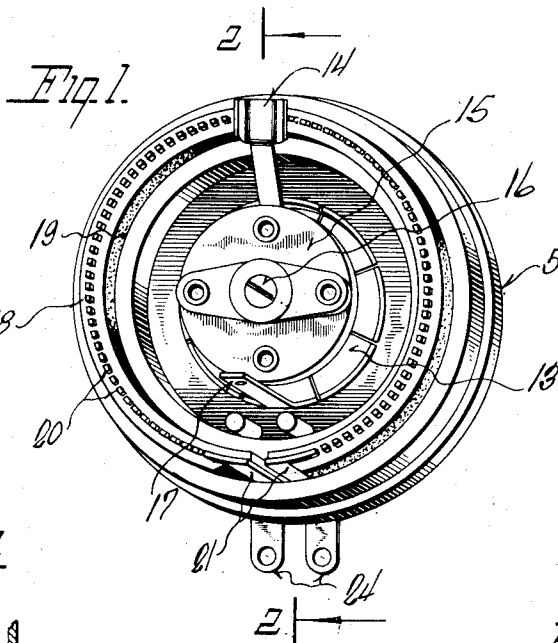
Sept. 20, 1932.

R. P. MATTERN

1,877,926

RHEOSTAT

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UNITED STATES PATENT OFFICE

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RHEOSTAT

Application filed February 28, 1930. Serial No. 432,210.

This invention relates to certain new and useful improvements in rheostats of the type employed in connection with radio apparatus, and has as an object, the provision of novel means for providing good electrical connection between any portion of a high resistance unit and a movable contact arm.

Another object of this invention resides in the provision of a resistor unit molded or cast of material having a relatively high resistance value and having members of low resistance embedded therein to insure a good electrical connection between any portion of the resistor unit and a movable contact arm.

Another object of this invention resides in the provision of a resistor unit of the character described in which terminal members of low resistance are embedded therein in such a manner as to insure absolute and permanent stability.

A further object of this invention resides in the provision of a resistor unit of the character described which comprises integrally connected sections having different degrees of resistance.

And a still further object of this invention resides in the provision of a novel resistor unit of the character described which is simple in construction and which lends itself particularly well to economical production.

With the above and other objects in view which will appear as the description proceeds, my invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claim, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claim.

In the accompanying drawing, I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a perspective view of a rheostat embodying my invention;

Figure 2 is a transverse sectional view

taken through Figure 1 on the plane of the line 2—2;

Figure 3 is a perspective view of the resistor unit per se shown detached from the rheostat, and

Figure 4 is an enlarged perspective sectional view of the resistor unit.

Referring now more particularly to the accompanying drawing, the numeral 5 represents the base of the rheostat which is centrally apertured, as at 6, for the reception of a bushing 7 in which an actuating shaft 8 is freely rotatably mounted. The bushing 6 is maintained in proper assembled relation with the base by a nut 9, and extends outwardly from the base to provide convenient means for mounting the rheostat from a panel 10.

The outer end 11 of the shaft 8 is enlarged to form a shoulder which engages the adjacent bushing end to prevent inward movement of the shaft, and has a control knob 12 fixed thereon. The opposite end of the shaft projects through a spring washer 13, the inner end of a movable contact arm 14, and a pair of insulating discs 15 to which the arm is riveted or otherwise secured. A screw 16 threaded in the shaft secures the elements in proper assembly and places the spring washer 13 in compression to maintain a frictional drive connection between the shaft and the discs 15 carrying the movable contact arm. The resiliency of the spring washer also provides a good electrical connection between the arm and a terminal 17 formed integral with the spring washer.

The outer free end of the arm is movable over and frictionally engageable with an annular resistor unit 18 mounted in an annular recess 19 formed in the base 5. The resistor unit is molded or cast of powdered resistance material having the desired resistivity and to insure good electrical contact between it and the movable contact arm 14, a plurality of metal prongs or bars 20 are embedded in the resistor unit at the time of its formation.

For convenience in production the prongs or bars may be the teeth of a metal comb from which the back portion "B" (see Figure 4) is severed along the line "C" after the

molding of the unit, as described in my co-
 pending application, Serial No. 432,211 filed
 Feb. 28, 1930, and to insure intimate elec-
 trical contact between the prongs and the
 5 molded material they are preferably silver
 plated and coated with deflocculated graphite,
 prior to being embedded in the material.

As best illustrated in Figure 3, the bars 20
 are substantially entirely embedded in the
 10 unit and have only one end projecting slight-
 ly beyond the surface of the unit to provide
 a plurality of closely spaced contact surfaces
 extending around the entire circumference
 of the unit, with which the contact arm 14 is
 15 frictionally engageable. It is also noted that
 the bars 20 have but a small cross sectional
 area and are straight and parallel with the
 side walls of the unit, which reduces internal
 stresses to a minimum and insures permanent
 20 intimacy of contact between the bars and the
 unit and consequently absolute stability.

At two adjacent points in the circumference
 of the unit, the bars 20 are replaced by ter-
 minal members 21 which have apertures 21'
 25 near their inner sides to increase the bond be-
 tween them and the molded material, and the
 material filling the intervening space between
 the terminal members is cut away. Conduc-
 tors 22 soldered or otherwise secured to the
 30 terminal members 21 are passed through suit-
 able apertures 23 through the base in com-
 munication with the annular channel or recess
 19 and have their end portions soldered or
 otherwise fixed to terminal lugs 24. The ter-
 35 minal lugs 24 are secured to the base by rivets
 25 whose inner ends are elongated to provide
 stops for limiting the rotational movement
 of the contact arm 12.

The space between the separated ends of
 40 the unit enables it to be sprung slightly in
 either direction to facilitate its assembly with
 the base where it is held by the inherent
 resiliency of the unit. The space between the
 ends of the unit also provides room for it to
 45 expand and the conductors 22, besides elec-
 trically connecting the ends of the unit with
 the terminal lugs prevent accidental detach-
 ment of the unit from the base. By provid-
 ing a terminal 24 for each end of the unit,
 50 the rheostat may be used as a potentiometer,
 as will be readily obvious.

If desired, the resistance unit may com-
 prise sections of different degrees of resistiv-
 ity, and the present unit is divided into four
 55 individual sections which are indicated by
 a difference in shading. To obtain this com-
 posite resistor it is only necessary to divide
 the forming mold into separated compart-
 60 ments and to fill the various compartments
 with powder having the desired resistance
 values, after which the dividing means are
 removed and the powders compressed. Dur-
 ing the compression of the unit, the adjacent
 65 powders merge into each other and fuse so

that the step in resistance from one section to
 another is not abrupt.

The completed unit also may be thoroughly
 impregnated with wax to protect the same
 against moisture, and in Figure 4 a coating 70
 of wax "W" is indicated.

From the foregoing description, taken in
 connection with the accompanying drawing,
 it will be readily apparent to those skilled in
 the art to which an invention of the character 75
 described appertains, that I provide a novel
 manner of assuring good electrical contact
 between a molded high resistance unit and a
 movable contact arm, and a novel construc-
 tion for a resistor unit which is entirely self 80
 supporting to facilitate its assembly with and
 removal from any desired apparatus, and
 wherein absolute stability is assured.

What I claim as my invention is:

A rheostatic resistor, comprising a split 85
 ring of molded material of high resistance
 value and having sufficient rigidity to be self-
 supporting, a series of elongated contact
 members and having all portions save their
 90 outer ends permanently embedded in the ring
 of molded material, terminal members per-
 manently embedded in the ring of molded
 material at the ends of the series of contact
 members and having their outer ends exposed 95
 to provide contact surfaces and their sides
 exposed to facilitate the connection of con-
 ductors therewith, and material of high con-
 ductivity characteristics between the contact
 and terminal members and the molded ma-
 100 terial to provide an intimate electrical con-
 tact between the molded material of high
 resistance value and the contact and terminal
 members.

In testimony whereof I have hereunto af-
 fixed my signature. 105

RAYMOND P. MATTERN.

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